Electronic Supplementary Material (ESI) for Soft Matter.

Disclosed New Evidence for Networking in Natural Rubber by Dielectric Relaxation Spectroscopy

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Supporting Information

Stress-strain curves of NR, DPNR and TE-DPNR

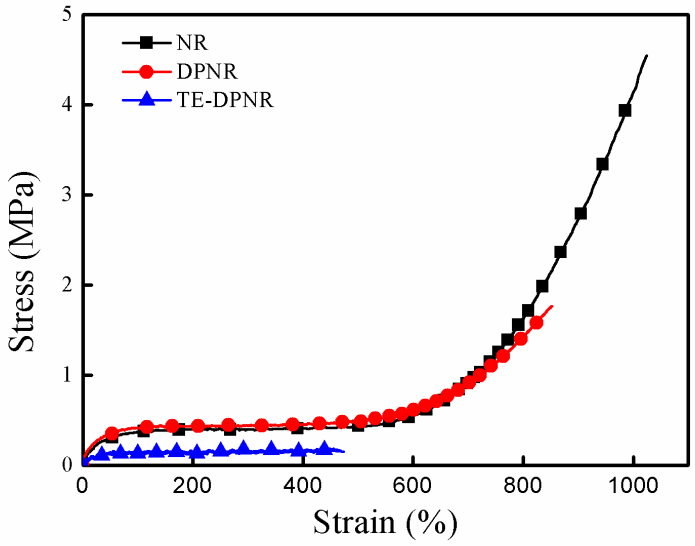

Fig. S1 Stress-strain curves of NR, DPNR and TE-DPNR

SAXS curves of NR and DPNR

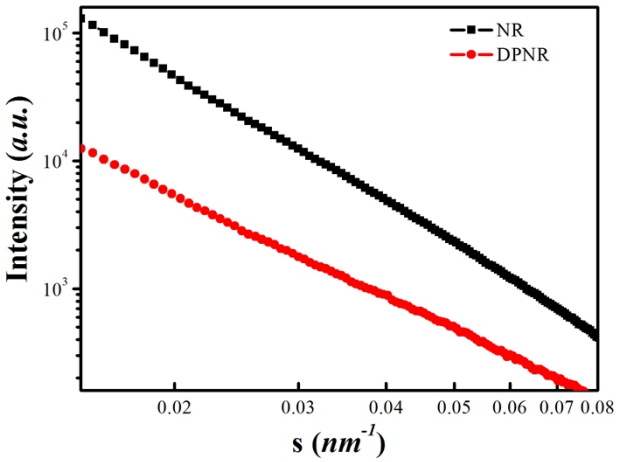

Fig. S2 SAXS curves of NR and DPNR

ε'(T) of NR, DPNR and TE-DPNR

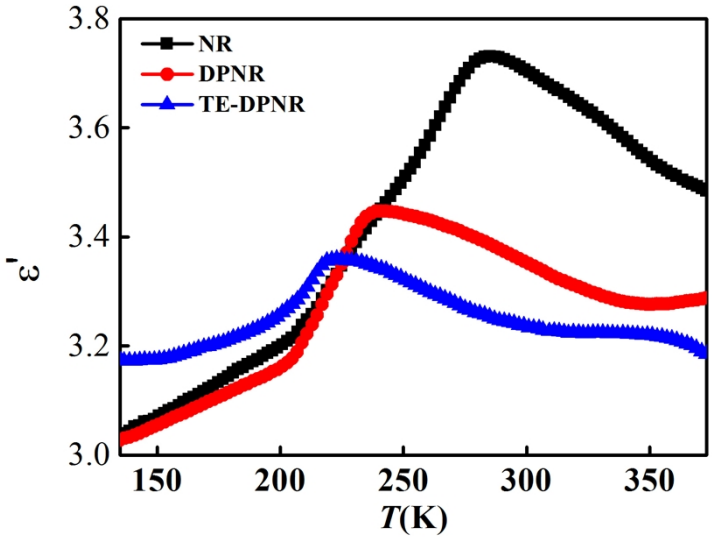

Fig. S3 ε'(T) of NR, DPNR and TE-DPNR at 7 Hz.

Dielectric loss spectra of (a) NR and (b) DPNR (c) TE-DPNR using a HN function for fitting at 223K

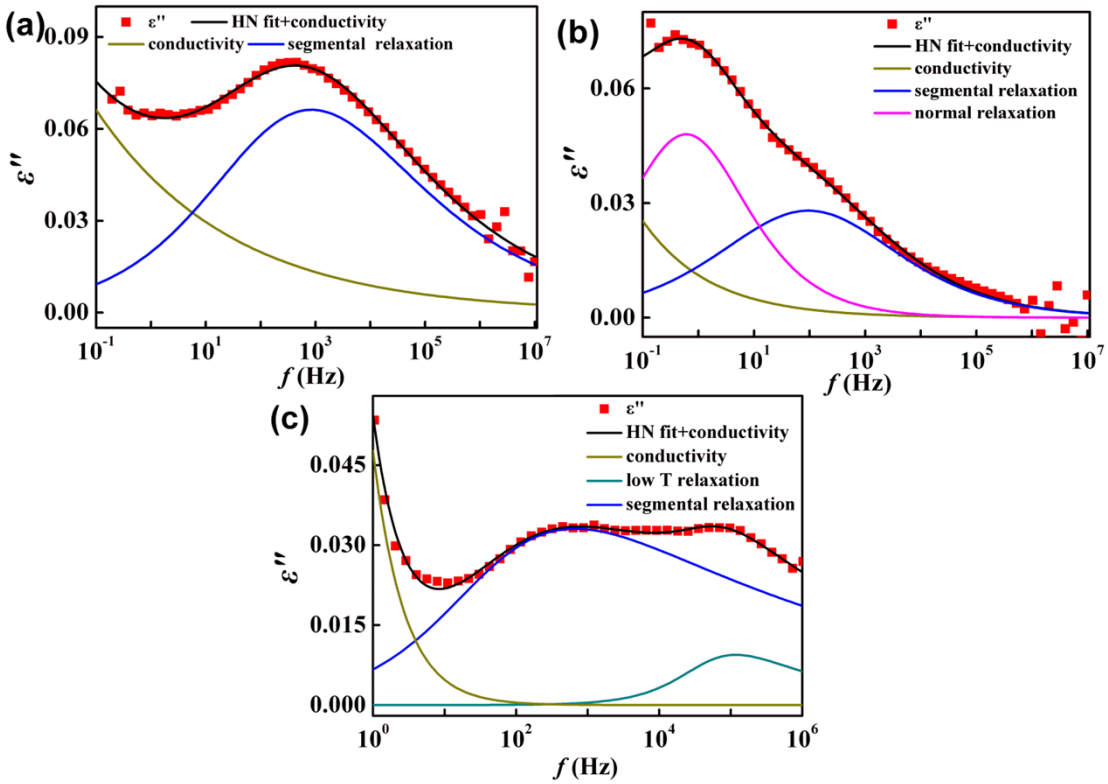

Fig. S4 Dielectric loss spectra of (a) NR and (b) DPNR (c) TE-DPNR using a HN function for fitting at 223K

Dielectric loss spectra of NR using a HN function for fitting at 283K

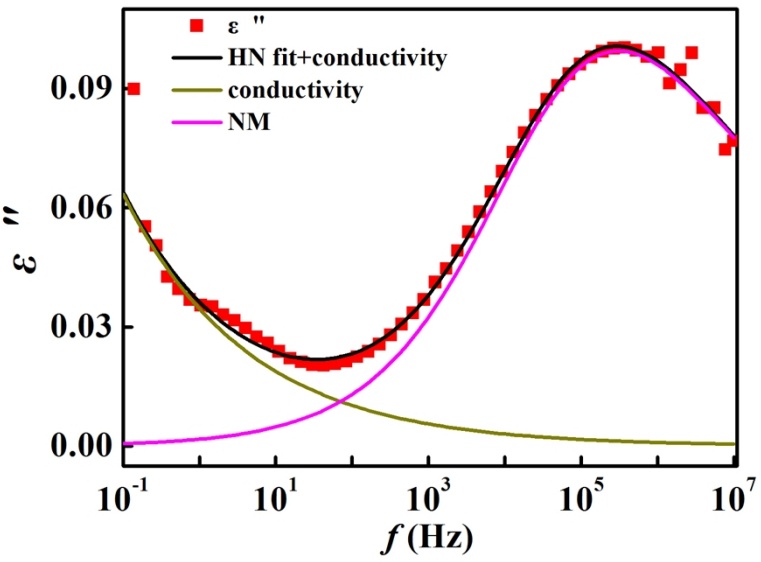

Fig. S5 Dielectric loss spectra of NR using a HN function for fitting at 283K

Activation plot for SM, NM and the new mode relaxation for DPNR

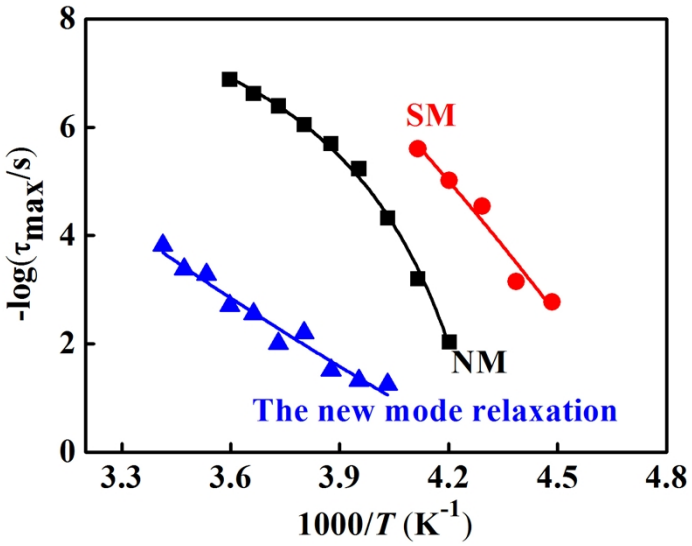

Fig.S6 Activation plot for SM, NM and the new mode relaxation for DPNR. The lines represent fits of Equation 6.

Dielectric loss ε″ vs. frequency of TE-DPNR

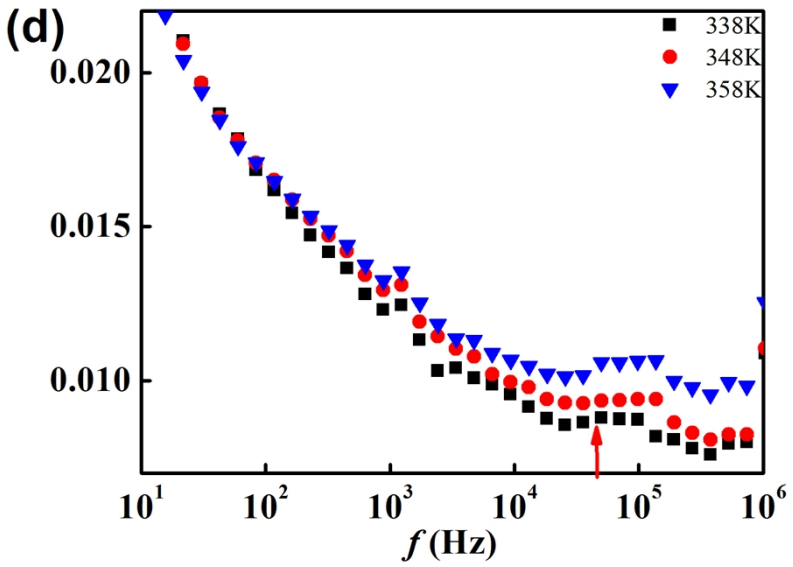

Fig.S7 Dielectric loss ε″ vs. frequency of TE-DPNR at 338K to 358K. The red arrows indicate the emerging of NM peaks at 338K

Table S1 The peak value of ε″ for NM modes in Fig. 3.

Sample	Relaxation mode	Peak value of ε″
NR	NM	0.0735
DPNR	NM	0.0523
TE-DPNR	NM	0.0196

Table S2 Fitting parameters for SM and NM in the typical spectra illustrated in Fig. S4, Fig. S5, Fig. 6(b) and Fig.8.

Sample	Mode	*T*/*K*	α	β	τ_0/s	τ_{max}/s
NR	SM	223	0.3713	0.6208	6.568×10^{-4}	1.886×10^{-4}
DPNR	SM	223	0.3851	1	1.675×10^{-3}	1.675×10^{-3}
TE-DPNR	SM	223	0.5218	0.2061	4.239×10^{-3}	2.372×10^{-4}
NR	NM	283	0.4535	0.3442	4.940×10^{-6}	5.156×10^{-7}
DPNR	NM	283	0.7090	0.7585	1.212×10^{-7}	8.550×10^{-8}
DPNR	The new mode	283	0.4156	0.9740	5.529×10^{-4}	5.201×10^{-4}
TE-DPNR	LTM	173	0.3816	1	3.944×10^{-3}	3.944×10^{-3}